UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,267	10/01/2001	Kiyoaki Murai	110750	4174

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EXAMINER
BELL, PAUL A

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Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>04 December 2003</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-22</u> is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>11-17</u> is/are allowed.

6)☒ Claim(s) <u>1,2,5 and 18-22</u> is/are rejected.

7)☒ Claim(s) <u>3,4 and 6-10</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All b)☐ Some * c)☐ None of:

   1.☒ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
   application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1, 2, 5, and 18-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsushiro et al. (6,201,612).

With regard to claim 1 Matsushiro et al. teaches an image processing method, comprising: inputting data indicating a grayscale of a pixel (figure 5, "MULTI-LEVEL IMAGE" , into item 7); converting said input data into grayscale data which specifies a grayscale of an image output apparatus according to predetermined characteristics (figure 5, item 8, SELECTOR picks item 21 or item 11 based on predetermined characteristics SEE column 10 lines 3-27); and when said input data corresponds to a specific grayscale value which causes a defect in an output of said image output apparatus (ABSTRACT and column 2, lines 17-18 also see column 10 lines 3-27) **converting at least part of said input data into grayscale data which specifies a grayscale value other than the specific grayscale value, and supplying the converted grayscale data to said image output apparatus** (figure 5, the selector picks item 21 (grayscale value other) or item 11 (specific grayscale value) then outputs BI-LEVEL IMAGE data, now see column 1, lines 17-18 "Multi-level images are often printed or displayed by bi-level output devices capable of expressing only two levels" ,

and also see column 1, lines 24-29 "among the known techniques for converting multi-level images to bi-level images are **halftone** patterns, dithering, error diffusion, and mean error minimization", and still further see column 2 , lines 10-16 "An object of the present invention is to provide an image processing apparatus, method, and computer program for converting a multi-level image to be a bi-level image, combining high processing speed with <u>smooth</u> **expression of gray levels.**").

With regard to claim 2. Matsushiro et al. teaches an image processing method according to claim 1, said converting further comprising a color reduction processing that reduces the number of levels which is indicatable by said input data into the number of levels which is indicatable by said grayscale data (column 1, lines 5-24).

With regard to claim 5. Matsushiro et al. teaches an image processing method, comprising: inputting data which indicates a grayscale of a pixel (figure 5, "MULTI-LEVEL IMAGE" , into item 7); and converting said input data into grayscale data which specifies a grayscale of an image output apparatus by reducing the number of levels of said input data according to predetermined characteristics(figure 5, item 8, SELECTOR column 1, lines 5-10);   and by performing **pseudo-halftone** processing that **displays a halftone,** in which, when said input data corresponds to a specific grayscale value which causes a defect in an output of said image output apparatus (ABSTRACT), at least part of said input data is **converted into grayscale data which specifies one of grayscale values <u>adjacent</u> to said specific grayscale value,** and supplying the converted data to said image output apparatus (figure 5, the selector picks item 21 (grayscale value other) or item 11 (specific grayscale value) then outputs BI-LEVEL

IMAGE data, now see column 1, lines 17-18 "Multi-level images are often printed or

displayed by bi-level output devices capable of expressing only two levels" , and also

see column 1, lines 24-29 "among the known techniques for converting multi-level

images to bi-level images are **halftone** patterns, dithering, error diffusion, and mean

error minimization", and still further see column 2 , lines 10-16 "An object of the present

invention is to provide an image processing apparatus, method, and computer program

for converting a multi-level image to be a bi-level image, combining high processing

speed with <u>smooth</u> **expression of gray levels**." , and still even further the word

"adjacent" is a broad concept whereby any grayscale value other than the specific

grayscale value is inherently adjacent to it).

With regard to claim 18 Matsushiro et al. teaches an image processing

apparatus, comprising: a conversion circuit that converts data indicating a grayscale of

a pixel into grayscale data which specifies a grayscale of an image output apparatus

according to predetermined characteristics (figure 5), wherein, when said input data

corresponds to a specific grayscale value which causes a defect in an output of said

image output apparatus (abstract), **said conversion circuit converts at least part of**

said input data into grayscale data which specifies a grayscale value other than

the specific grayscale value, and supplies the converted grayscale data to said image

output apparatus (figure 5, the selector picks item 21 (grayscale value other) or item 11

(specific grayscale value) then outputs BI-LEVEL IMAGE data, now see column 1,

lines 17-18 "Multi-level images are often printed or displayed by bi-level output devices

capable of expressing only two levels" , and also see column 1, lines 24-29 "among the

known techniques for converting multi-level images to bi-level images are **halftone**

patterns, dithering, error diffusion, and mean error minimization", and still further see

column 2 , lines 10-16 "An object of the present invention is to provide an image

processing apparatus, method, and computer program for converting a multi-level

image to be a bi-level image, combining high processing speed with smooth

expression of gray levels.").

With regard to claim 19 Matsushiro et al. teaches an image processing

apparatus, comprising: a conversion circuit that converts data indicating a grayscale of

a pixel into grayscale data which specifies a grayscale of an image output apparatus by

reducing the number of levels of said input data according to predetermined

characteristics (figure 5), and by performing **pseudo-halftone** processing for

displaying a halftone, wherein said conversion circuit **converts** at least part of the

data corresponding to a specific grayscale value which causes a defect in an output of

said image output apparatus into **grayscale data which specifies one of grayscale**

values adjacent to said specific grayscale value, and supplies the converted data to

said image output apparatus (figure 5, the selector picks item 21 or item 11 then output

BI-LEVEL IMAGE). (figure 5, the selector picks item 21 (grayscale value other) or item

11 (specific grayscale value) then outputs BI-LEVEL IMAGE data, now see column 1,

lines 17-18 "Multi-level images are often printed or displayed by bi-level output devices

capable of expressing only two levels" , and also see column 1, lines 24-29 "among the

known techniques for converting multi-level images to bi-level images are **halftone**

patterns, dithering, error diffusion, and mean error minimization", and still further see

column 2 , lines 10-16 "An object of the present invention is to provide an image

processing apparatus, method, and computer program for converting a multi-level

image to be a bi-level image, combining high processing speed with smooth

expression of gray levels." and still even further the word "adjacent" is a broad

concept whereby any grayscale value other than the specific grayscale value is

inherently adjacent to it).

With regard to claim 20 Matsushiro et al. teaches an electronic device,

comprising: an image processing apparatus and an image output apparatus (figure 5),

said image processing apparatus converting data indicating a grayscale of a pixel into

grayscale data which specifies a grayscale of said image output apparatus by reducing

the number of levels of said input data according to predetermined characteristics and

by performing **pseudo-halftone** processing for **displaying a halftone** (abstract, and

column 1, lines 6-24), said image processing apparatus comprising a conversion circuit

that **converts** at least part of the input data corresponding to a specific grayscale value

which causes a defect in an output of said image output apparatus (abstract) into the

grayscale data which specifies one of grayscale values adjacent to said specific

grayscale value, and said image forming apparatus outputting an image according to

the grayscale data converted by said image processing apparatus (figure 5, the selector

picks item 21 or item 11 then output BI-LEVEL IMAGE). (figure 5, the selector picks

item 21 (grayscale value other) or item 11 (specific grayscale value) then outputs BI-

LEVEL IMAGE data, now see column 1, lines 17-18 "Multi-level images are often

printed or displayed by bi-level output devices capable of expressing only two levels" ,

and also see column 1, lines 24-29 "among the known techniques for converting multi-

level images to bi-level images are **halftone** patterns, dithering, error diffusion, and

mean error minimization", and still further see column 2 , lines 10-16 "An object of the

present invention is to provide an image processing apparatus, method, and computer

program for converting a multi-level image to be a bi-level image, combining high

processing speed with smooth **expression of gray levels**." and still even further the

word "adjacent" is a broad concept whereby any grayscale value other than the specific

grayscale value is inherently adjacent to it)

With regard to claim 21 Matsushiro et al. teaches an image processing program

which causes a computer (column 2, lines 50-55) that supplies grayscale data which

specifies a grayscale of an image output apparatus to said image output apparatus to

function as device that indicates a grayscale of a pixel into said grayscale data by

reducing the number of levels of the input data according to predetermined

characteristics and by performing **pseudo-halftone** processing for **displaying a**

halftone (abstract, column 1, lines 1-25), wherein the device **converts** at least part of

the data corresponding to a specific grayscale value which causes a defect in an output

of said image output apparatus into the **grayscale data which specifies one of**

grayscale values adjacent to said specific grayscale value, and supplies the

converted grayscale data to said image output apparatus (figure 5, the selector picks

item 21 or item 11 then output BI-LEVEL IMAGE). (figure 5, the selector picks item 21

(grayscale value other) or item 11 (specific grayscale value) then outputs BI-LEVEL

IMAGE data, now see column 1, lines 17-18 "Multi-level images are often printed or

displayed by bi-level output devices capable of expressing only two levels" , and also

see column 1, lines 24-29 "among the known techniques for converting multi-level

images to bi-level images are **halftone** patterns, dithering, error diffusion, and mean

error minimization", and still further see column 2 , lines 10-16 "An object of the present

invention is to provide an image processing apparatus, method, and computer program

for converting a multi-level image to be a bi-level image, combining high processing

speed with <u>smooth</u> **expression of gray levels**." and still even further the word·

"adjacent" is a broad concept whereby any grayscale value other than the specific

grayscale value is inherently adjacent to it).

With regard to claim 22 Matsushiro et al. teaches (Amended) A computer-

readable recording medium on which an image processing program is recorded

(column 2, lines 50-55), said image processing program causing a computer for

supplying grayscale data which specifies a grayscale of an image output apparatus to

said image output apparatus to function as device that indicates a grayscale of a pixel

into said grayscale data by reducing the number of levels of the input data according to

predetermined characteristics and by performing **pseudo-halftone** processing for

<u>displaying a halftone</u> (column 1, lines 5-25), wherein the device **converts** at least part

of the data corresponding to a specific grayscale value which causes a defect in an

output of said image output apparatus into the **grayscale data which specifies one of**

grayscale values <u>adjacent</u> to said specific grayscale value, and supplies the scale

data to said image output apparatus (figure 5, the selector picks item 21 (grayscale

value other) or item 11 (specific grayscale value) then outputs BI-LEVEL IMAGE data,

now see column 1, lines 17-18 "Multi-level images are often printed or displayed by bi-level output devices capable of expressing only two levels" , and also see column 1, lines 24-29 "among the known techniques for converting multi-level images to bi-level images are **halftone** patterns, dithering, error diffusion, and mean error minimization", and still further see column 2 , lines 10-16 "An object of the present invention is to provide an image processing apparatus, method, and computer program for converting a multi-level image to be a bi-level image, combining high processing speed with smooth **expression of gray levels**." and still even further the word "adjacent" is a broad concept whereby any grayscale value other than the specific grayscale value is inherently adjacent to it).

Allowable Subject Matter

3.   Claims 3, 4, and 6-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4.   Claims 11-17 are allowed.

5.   The following is a statement of reasons for the indication of allowable subject matter: with regard to claims 11-22 none of the prior art made of record teach or suggest the feature identified below for each independent claim in combination with all the other limitations of the claim.

With regard to claim 11 the feature, "selecting a dither value according to coordinates of said pixel from a predetermined dither matrix for pseudo-halftone processing".

With regard to claim 13 the feature, "when a result of said determination is yes, adding a doubled value of said dither value and a value according to said color reduction to said input data so as to convert said input data into data which specifies one of grayscale values adjacent to said specific grayscale value according to the addition result".

With regard to claim 15 the feature "pre-processing compresses a range from a center value corresponding to one of grayscale values adjacent to a specific grayscale value which causes a defect in an output of said image output apparatus to a center value corresponding to the other adjacent grayscale value into a range from the center value corresponding to one of the grayscale values adjacent to said specific grayscale value to a center value corresponding to said specific grayscale value".

With regard to claim 16 the feature "pre-processing compresses a range from a center value corresponding to one of grayscale values adjacent to a specific grayscale value which causes a defect in an output of said image output apparatus to a center value corresponding to the other adjacent grayscale value into a range from the center value corresponding to one of the grayscale values adjacent to said specific grayscale value to a center value corresponding to said specific grayscale value".

With regard to claim 17 the feature, "pre-processing compresses a range from a center value corresponding to one of grayscale values adjacent to a specific grayscale value which causes a defect in an output of said image output apparatus to a center value corresponding to the other adjacent grayscale value into a range from the center value corresponding to one of the grayscale values adjacent to said specific grayscale value to a center value corresponding to said specific grayscale value".

Response to Arguments

6.   Applicant's arguments filed 12/4/2003 have been fully considered but they are not persuasive.

The applicant argues on page 2 with regard to claim 1 that Matsushiro fails to teach or disclose, "converting at least part of said input data into grayscale data which specifies a grayscale value other than the specific grayscale value and supplying the converted grayscale data into said image output apparatus".

The examiner disagrees and references the more detailed rejection above with regard to this very broad language used.

The applicant argues on page 3 with regard to claim 5 that Matsushiro fails to teach or disclose, "the converted grayscale data which specifies one of the grayscale values adjacent to said specific grayscale value"

The examiner disagrees and references the more detailed rejection above with regard to this very broad language used.

The applicant argues on page 4 with regard to claim 18 that Matsushiro fails to teach or disclose, "a conversion circuit converts at least part of said input data into

grayscale data which specifies a grayscale value other than the specific grayscale value".

The examiner disagrees and references the more detailed rejection above with regard to this very broad language used.

The applicant argues on page 5 with regard to claims 19-22 that Matsushiro fails to teach or disclose, "the converted grayscale data which specifies one of the grayscale values adjacent to said specific grayscale value".

The examiner disagrees and references the more detailed rejection above with regard to this very broad language used.

COMMENTS

7.   The examiner sees many similarities between Matsushiro reference and applicant's specification for example they both seem to deal with taking multi-level image data (3 or more levels) and converting by a processing means that avoid abrupt changes in image content to halftone data (bi-level data for example 2 levels) which the observer perceives as grayscale by spatial and time integration of the eye. It does appear based on applicants specification (not claims) that possibly applicants apparatus may also work directly with grayscale displays capable of 3 or more levels because his figure 7 illustrate 255 levels being converted to 7 levels.

Conclusion

8.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

9.   Any inquiry concerning this communication or earlier communications from the
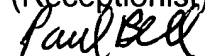examiner should be directed to Paul Bell whose telephone number is (703) 306-3019.

If attempts to reach the examiner by telephone are unsuccessful the Technology
Center 2600 Customer Service Office whose telephone number is (703) 306-0377 can
help with any inquiry of a general nature or relating to the status of this application.

Any response to this action should be mailed to:

> Commissioner of Patents and Trademarks
> Washington, D.C. 20231

Or Faxed to: (703) 872-9306

Or Hand-delivered to: Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor
(Receptionist).

Paul Bell
Art unit 2675
February 12, 2004

CHANH NGUYEN
PRIMARY EXAMINER